

2. FACILITY DESCRIPTION

2.1 Site Description

The INL encompasses approximately 2,276 km² (890 mi²) on the Eastern Snake River Plain in southeastern Idaho, west of Idaho Falls. Within the laboratory complex are eight major applied engineering, interim storage, and research and development facilities. Established in 1949 as the National Reactor Testing Station, the INL continues to safely build, test, and operate various types of nuclear reactor facilities for the United States Government.

The INTEC is situated on the south-central portion of the INL site (Figure 2-1) and occupies an enclosed and secured area of approximately 1 km² (250 acres). Current work at INTEC includes receiving and storing spent nuclear fuel, environmental restoration, radiological deactivation, decontamination, and decommissioning activities, mixed waste treatment, and technology development (DOE-ID 1995).

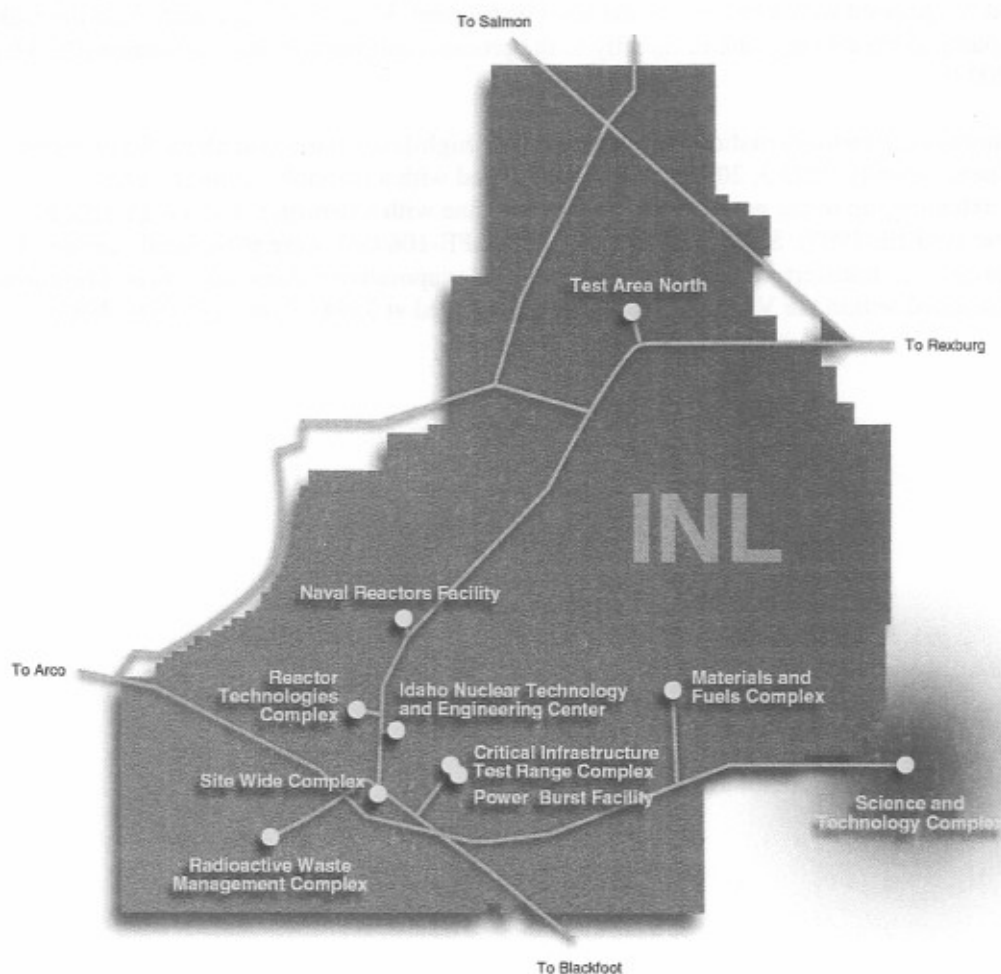


Figure 2-1. Map of the INL site.

2.2 Tank Description and Operational History

The VES-SFE-106 tank system was placed into service in 1972 and was used to store characteristically hazardous wastes that were generated as a result of spent nuclear fuel storage activities, including treatment of the basin water that provided radioactive shielding for the spent nuclear fuel. The CPP-603 fuel storage basin water was treated in the CPP-603 Basin Water Treatment System (BWTS), which circulated the water through ion exchange columns and sand filters and then back to the three storage basins. The waste generated by the BWTS was pumped to the VES-SFE-106 tank for storage (Figure 2-2). This waste stream was further treated by a clarification process within the tank (DOE-ID 2004a).

The VES-SFE-106 tank is a 25,000-gal waste storage and treatment tank constructed of Type 304 stainless steel (Figure 2-3). The tank is horizontal and cylindrical with domed ends and is located in a concrete vault that includes a sump. The vault was lined in 1997 with a chlorosulfonated polyethylene (hypalon) liner, which extends 4 ft. 5 in. up the walls of the vault. The vault sump is constructed of stainless steel and is equipped with a bubbler probe level instrument. In the event of a spill from the tank, the sump can be pumped back to the tank or directly to the process equipment waste evaporator (PEWE) system (ISD-3, 2002).

The tank monitoring instrumentation is equipped with a high-level alarm that alerts the operator when the tank is near capacity (ISD-3, 2002). It is also equipped with a manhole, sampling and monitoring lines extending up to the ground level, an air vent line with a demister, and a high-efficiency particulate air filter (INEEL 1997). Solids settled in the VES-SFE-106 tank were periodically removed and disposed; liquids were transferred to the PEWE system for evaporative volume reduction. The current sludge volume contained within the VES-SFE-106 tank is estimated at 5,000–7,000 gal (EDF-3983, 2003).

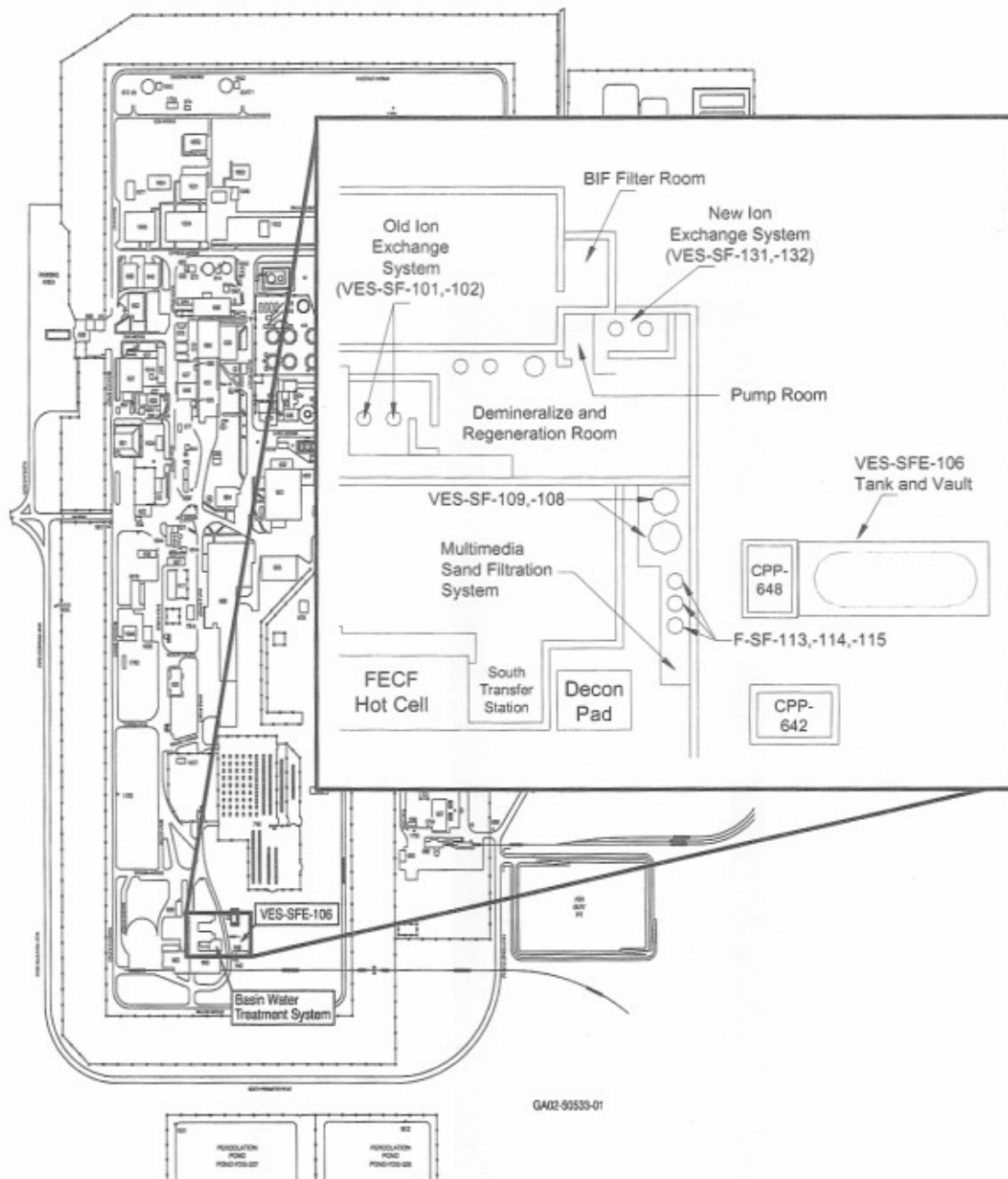


Figure 2-2. Location of the VES-SFE-106 tank system and associated CPP-603 systems.

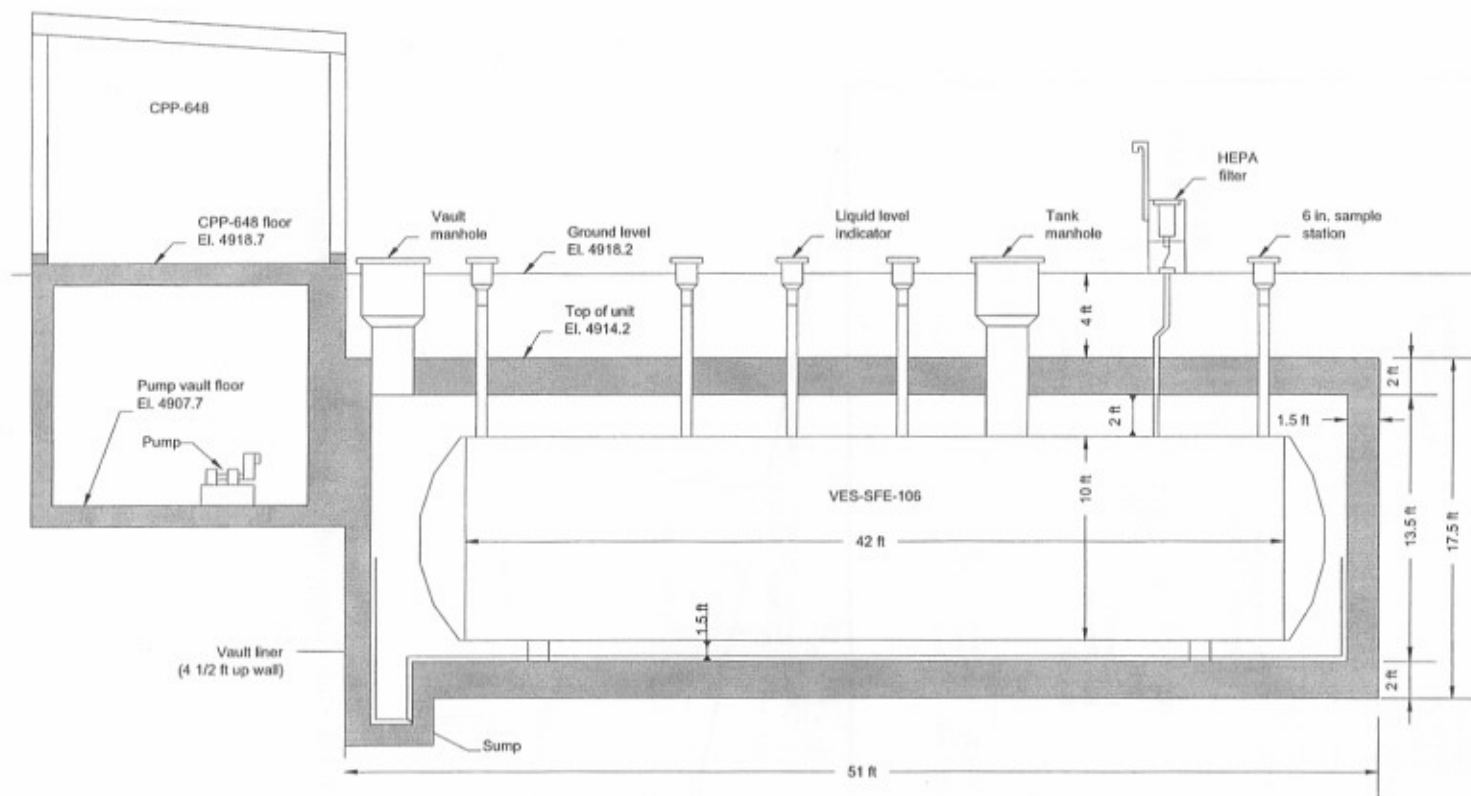


Figure 2-3. Elevated view of Tank VES-SFE-106.

2.3 Associated Piping and Ancillary Equipment

The tank system to be closed includes the radioactive solid and liquid waste storage tank (VES-SFE-106) and associated ancillary piping and equipment that ties the tank system to the BWTS (DOE-ID 2004a), the VES-SFE-126 waste collection tank (INEEL 2000), and the PEWE system (DOE-ID 2003). Waste discharge piping from the old ion exchange vessels, the new ion exchange vessels, the sand filter system, and the BIF filter drain that discharge to VES-SFE-106 will be closed under this HWMA/RCRA closure plan. Piping and ancillary equipment within CPP-648 that managed or potentially managed hazardous waste will also be closed under this HWMA/RCRA closure plan. Discharge piping from the VES-SFE-106 waste tank to the PEWE system will also be closed to the point that it connects to the permitted system.

Piping and equipment considered ancillary to the VES-SFE-106 tank system will be addressed under this closure plan with the exception of those lines and equipment specified in Table 2-1, which did not manage HWMA/RCRA-hazardous waste. Lines 1" HAA-100392, 1" HAA-100393, and 1" HAA-100394 are stainless steel high-pressure air lines that managed only compressed air upstream of the first isolation valve, and lines 1/2" RWAM-155454 and 3/4" RWAR-155940 are stainless steel raw water lines that managed only raw water. Lines 1" BWA-100307 and 2" PLA-100308 are stainless steel basin water return lines that managed only clarified basin water that has been determined to be nonhazardous (EDF-2619, 2002; EDF-2621, 2001). The VES-SFE-106 filtered vent managed only off-gas exhausted from the VES-SFE-106 waste tank. Since the off-gas received by the unit was not a contained gas, the off-gas was not a solid waste subject to HWMA/RCRA regulations. The nonhazardous piping and ancillary equipment may be removed during closure activities.

Table 2-1. Nonhazardous piping and ancillary equipment.

Piping and Ancillary Equipment	Description
1" HAA-100392	Upstream of valve HAV-SFE-67
1" HAA-100393	Upstream of valve HAV-SFE-69
1" HAA-100394	Upstream of valve HAV-SFE-68
1/2" RWAM-155454	Upstream of valve RWV-SFE-151
3/4" RWAR-155940	Upstream of valve RWV-SFE-159
1" BWA-100307	Downstream from line 2" PLA-100308
2" PLA-100308	Downstream from valve PLV-SFE-42
VES-SFE-106 Filtered Vent	Surface vent connected to VES-SFE-106 via line 2" VGA-100336

2.4 System Boundaries

The system boundaries have been established to define the breakpoints between the VES-SFE-106 tank system and the BWTS and VES-SFE-126 closures, PEWE, and components of the system that did not manage hazardous waste. The VES-SFE-106 tank system closure boundaries are listed in Table 2-2 and shown on Schematic P-CLOS-VES-SFE-106 (Figure 2-4).

2.3 Associated Piping and Ancillary Equipment

The tank system to be closed isolates the radioactive waste and liquid waste storage tank (VES-2FE-106) and associated auxiliary piping and equipment that ties the tank system to the BWTS (DOE ID 30045), the VES-2FE-126 waste collection tank (HBEI 3000), and the PEWE system (DOE ID 3003). Waste discharge piping from the old ion exchange vessels, the new ion exchange vessels, the sand filter system, and the HIF filter drain that discharge to VES-2FE-106 will be closed under this HWMARCA closure plan. Piping and auxiliary equipment within CTF-618 that managed or potentially managed hazardous waste will also be closed under this HWMARCA closure plan. Discharge piping from the VES-2FE-106 waste tank to the PEWE system will also be closed to the point that it connects to the permitted system.

Piping and equipment considered ancillary to the VES-2FE-106 tank system will be addressed under this closure plan with the exception of those lines and equipment specified in Table 2-1, which did not manage HWMARCA-hazardous waste. Lines 1" HAA-100393, 1" HAA-100393, and 1" HAA-100394 are stainless steel high-pressure air lines that managed only compressed air upstream of the first isolation valve, and lines 12" RWAM-12240 and 34" RWAR-12240 are stainless steel raw water lines that managed only raw water. Lines 1" BWA-100303 and 2" PLA-100303 are stainless steel drain water return lines that managed only clarified basin water that has been determined to be nonhazardous (EOP-3019, 3002; EOP-3021, 3001). The VES-2FE-106 filter vent managed only off-gas extracted from the VES-2FE-106 waste tank. Since the off-gas received by the tank was not a contained gas, the off-gas was not a solid waste subject to HWMARCA regulation. The nonhazardous piping and ancillary equipment may be removed during closure activities.

Table 2-1. Nonhazardous piping and ancillary equipment

Piping and Ancillary Equipment	Description
1" HAA-100393	Upstream of valve HAV-2FE-67
1" HAA-100393	Upstream of valve HAV-2FE-69
1" HAA-100394	Upstream of valve HAV-2FE-68
12" RWAM-12240	Upstream of valve RWV-2FE-121
34" RWAR-12240	Upstream of valve RWV-2FE-122
1" BWA-100303	Downstream from line 1" PLA-100303
2" PLA-100303	Downstream from valve PLV-2FE-41
VES-2FE-106 Filtered Vent	Surface vent connected to VES-2FE-106 via line 2" VOA-100316

2.4 System Boundaries

The system boundaries have been established to define the endpoints between the VES-2FE-106 tank system and the BWTS and VES-2FE-126 closures, PEWE, and components of the system that did not manage hazardous waste. The VES-2FE-106 tank system closure boundaries are listed in Table 2-1 and shown on schematic P-CLOS-VES-2FE-106 (Figure 2-4).

Table 2-2. Closure boundaries.

Boundary No.	Associated System	Description
1	Old Ion Exchange	Valve V-18 on line 2" BWA-100280. Piping and equipment upstream of this valve will be addressed under Voluntary Consent Order (VCO) NEW-CPP-016 closure.
2	Old Ion Exchange	Line 2" PSA-100277 from vessel VES-SF-101. This vessel will be addressed under VCO NEW-CPP-016 closure.
3	Old Ion Exchange	Valve V-26 on line 2" PSA-100278. Piping and equipment upstream of this valve will be addressed under VCO NEW-CPP-016 closure.
4	Old Ion Exchange	Valve V-13 on line 2" BWA-100283. Piping and equipment upstream of this valve will be addressed under VCO NEW-CPP-016 closure.
5	Old Ion Exchange	Valve V-24 on line 2" BWA-100284. Piping and equipment upstream of this valve will be addressed under VCO NEW-CPP-016 closure.
6	Old Ion Exchange	Line 2" PSA-100285 from vessel VES-SFE-102. This vessel will be addressed under VCO NEW-CPP-016 closure.
7	Old Ion Exchange	Cap on line 2" PLA-100313 in CPP-603.
8	BIF	Line 2" PLA-100183 at the point at which the line is capped in CPP-603.
9	New Ion Exchange	Valve HCV-11 on line 3" BWA-105562. Piping and equipment upstream of this valve will be addressed under VCO NEW-CPP-016 closure.
10	New Ion Exchange	Valve HCV-22 on line 3" BWA-105597. Piping and equipment upstream of this valve will be addressed under VCO NEW-CPP-016 closure.
11	New Ion Exchange	Line 2" PSA-105586 from vessel VES-SF-131. This vessel will be addressed under VCO NEW-CPP-016 closure.
12	New Ion Exchange	Valve HCV-13 on line 3" BWA-105585. Piping and equipment upstream of this valve will be addressed under VCO NEW-CPP-016 closure.
13	New Ion Exchange	Valve HCV-18 on line 3" BWA-105588. Piping and equipment upstream of this valve will be addressed under the VCO NEW-CPP-016 closure.
14	New Ion Exchange	Valve HCV-19 on line 2" PSA-105587. Piping and vessel upstream of this valve will be addressed under VCO NEW-CPP-016 closure.
15	New Ion Exchange	Valve HCV-20 on line 3" PSA-105589. Piping and equipment upstream of this valve will be addressed under VCO NEW-CPP-016 closure.
16	Sand Filtration	Line UP-9 from vessel F-SF-113. This vessel will be addressed under VCO NEW-CPP-016 closure.
17	Sand Filtration	Line UP-10 from vessel F-SF-114. This vessel will be addressed under the VCO NEW-CPP-016 closure.
18	Sand Filtration	Line UP-11 from vessel F-SF-115. This vessel will be addressed under VCO NEW-CPP-016 closure.
19	Sand Filtration	Line 4" PLA-101208 from vessel VES-SF-109. VES-SF-109 will be addressed under VCO NEW-CPP-016 closure.
20	VES-SFE-106	Valve PLV-SFE-42 on line 2" PLA-100308. Piping downstream of this valve has been determined to be nonhazardous.
21	VES-SFE-106	Valve PLV-SFE-151 on line 1/2" RWAM-155454. Piping upstream of this valve has been determined to be nonhazardous.
22	VES-SFE-106	Valve HAV-SFE-67 on line 1" HAA-100392. Piping upstream of this valve has been determined to be nonhazardous.
23	VES-SFE-106	Valve HAV-SFE-69 on line 1" HAA-100393. Piping upstream of this valve has been determined to be nonhazardous.

Table 2-2. (continued).

Boundary No.	Associated System	Description
24	VES-SFE-106	Valve HAV-SFE-68 on line 1" HAA-100394. Piping upstream of this valve has been determined to be nonhazardous.
25	VES-SFE-106	Valve LI2V-SFE-106-6 on line UP-5. Piping upstream of this valve has been determined to be nonhazardous.
26	VES-SFE-106	Valve RWV-SFE-159 on line 3/4" RWAR-155940. Piping upstream of this valve has been determined to be nonhazardous.
27	VES-SFE-126	Valve PLV-SFE-127 on line 2" PLA-104803 in CPP-764. Piping and equipment upstream of this valve has been addressed as part of the 90-day closure of the VES-SFE-126 tank system.
28	VES-SFE-126	Valve PLV-SFE-128 on line 2" PLA-104803 in CPP-764. Piping and equipment upstream of this valve has been addressed as part of the 90-day closure of the VES-SFE-126 tank system.
29	PEWE	Valve PLV-FE-116 on line 2" PLA-104803 located in TB-5. Piping and equipment downstream of this valve is included in the Volume 14 RCRA Part B Permit Application for the INL Liquid Waste Management System (DOE-ID 2003).

Table 2-2 (continued)		
Boundary No.	Associated Systems	Description
24	VE2-SFE-105	Valve HAV-SFE-02 on line 1" HAA-10054. Piping upstream of this valve has been determined to be nonhazardous.
25	VE2-SFE-105	Valve L1V-SFE-105-6 on line 1" P-3. Piping upstream of this valve has been determined to be nonhazardous.
26	VE2-SFE-105	Valve RWV-SFE-120 on line 1" RWA-12046. Piping upstream of this valve has been determined to be nonhazardous.
27	VE2-SFE-125	Valve PLV-SFE-125 on line 1" PLA-10403 in CTP-764. Piping and equipment upstream of this valve has been addressed as part of the 90-day closure of the VE2-SFE-125 tank system.
28	VE2-SFE-125	Valve PLV-SFE-125 on line 1" PLA-10403 in CTP-764. Piping and equipment upstream of this valve has been addressed as part of the 90-day closure of the VE2-SFE-125 tank system.
29	SEWE	Valve PLV-SFE-116 on line 1" PLA-10403 located in TB-3. Piping and equipment downstream of this valve is included in the Volume 14 HCR. Part B Permit Application for the Int. Liquid Waste Management System (DOI-12-2007).